ABSTRACT

An apparatus for powering a voice coil motor retract circuit in a disk drive is disclosed. The apparatus allows a disk drive to power the voice coil motor retract circuit while also slowing the spinning disk. A DC-to-DC converter converts the back electromotive force from the spinning disk into voltage which drives the retract circuit. A feedback circuit controls the switching of the DC-to-DC converter based on the available voltage for performing the retract function. Importantly, the DC-to-DC converter allows the disk to be slowed while simultaneously providing power to the retract circuit. In one embodiment, the windings of the spindle motor are used as the inductor element in the DC-to-DC converter. The power MOSFETs associated with the spindle motor are used as the diode unit and the switch unit of the DC-to-DC converter. The power supply capacitor is used as the output capacitor of the DC-to-DC converter. The feedback circuit provides a fixed off time in which energy is transferred from the spindle motor windings into the DC-to-DC converter output capacitor, and a minimum on time in which energy is allowed to build in the spindle motor windings. A method for powering the voice coil motor retract circuit while braking the disk is also disclosed.